

as much an art as a science—that it is the doctor's business as much to understand his patients as to treat their diseases.

There is less of the technician in the general practitioner's approach than in that of any other and generally there exists a far finer sympathy and understanding because of the closeness of the relationship; but the general practitioner should properly evaluate the elements of anxiety and apprehension that play such a large part in the patient-doctor relationship and the psychological effect of that attitude. If he is to make the most of the unique position of family advisor he must understand the fear complex that either initiates or quickly arises out of the sick state. He must be able to penetrate and appraise a complicated psychology that often induces an invalidism unnecessary and avoidable. He should have a fuller appreciation, not only of the frequency of social and psychical inadequacies but of the mechanisms by which they find their expression in common forms of ill health.

Too little attention is given to disposition, slightly abnormal tendencies and reaction types and too little is known by the general practitioner of the potentiality of these variations being elaborated into disease states under the magic of suggestion, lay or medical. More and more is it becoming apparent that affective states operating through the endocrines and the autonomic system are responsible for great numbers of the chronic invalids and for a wide variety of physical signs and symptoms, while the conditions for which the doctor is consulted are merely end results or symptomatic sign posts.

I cannot believe that human life and behavior is so complex that a properly trained general practitioner may not understand this whole relation of man or patient. He need only have certain fundamental conceptions of psychology to pierce the veil of censorship and inhibition which surrounds us all individually and deal rationally with those difficulties of adjustment and adaptation that so often translate themselves into seeming physical disorders. Freudian psychoanalysis may be helpful to a better understanding of some of the mechanisms but it is helpful to the physician much as is a technical knowledge of pharmacology. It is a scientific attainment to understand the structural combination of complex arsenical drugs but of little value to the practitioner in the treatment of central nervous lues. I believe the proportion of patients is small whose troubles can be solved only by a technical psychoanalysis. Friendliness and sympathy on the part of the physician is usually sufficient to break down reserve on the part of the patient, while genial informality encourages confidence and promotes assurance and full confession.

Most of the elements that enter into the common variety of nervous disabilities are so well known to us in miniature in our own lives that their comprehension needs but common sense, an appreciation of the fundamentals of psychology and the medical viewpoint. No one of these ele-

ments can be omitted in the doctor's equipment if he is to succeed in the estimate of himself or his patient; for who better than the family physician, the friend and counselor can instill and maintain that morale without which no method can succeed and with it exhibit a humanness and interest tending to unite him and his patient in faith, hope and understanding.

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THE NARROW BISPINOUS DIAMETER—ITS INFLUENCE ON OCCIPUT POSTERIOR POSITIONS*

"HONORABLE MENTION" PAPER IN THE CLINICAL RESEARCH PRIZE COMPETITION OF THE SIXTIETH ANNUAL SESSION OF THE CALIFORNIA MEDICAL ASSOCIATION

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IN reviewing the prenatal record of a patient in labor with a persistent occiput posterior position, I casually observed that the bispinous diameter was 9.2 centimeter. This observation raised the question in my mind whether or not the narrow bispinous diameter might be an obstacle to rotation in occiput posterior positions.

NOTES ON THE LITERATURE

A study of the literature revealed that this subject is a very old one. Exactly a hundred years ago Velpeau¹ wrote that "the causes that occasion the posterior position to occur are little understood. It is better frankly to admit our ignorance than vaguely to refer them to this or that shape of the pelvis." In 1855 James Y. Simpson² stated that "in some, any, and in others, apparently every successive portion of the concavity of the floor of the pelvis seems to serve this purpose (rotation), but the spines of the ischia contribute far less than is generally believed."

The subject is seldom brought up in recent literature, and the few opinions expressed are rather vague and contradictory. Thus, Williams, Berkeley and Boney, Polak, Tweedy and Wrench, Peterson, Jaschke and Pankow, Munroe Kerr, Bumm, and others, do not even mention the ischial spines in their textbooks in discussing the etiology of persistent occiput posterior positions.

Lehle³ assumes that the ischial spines can have little to do with the posterior position since he very seldom found prominent spines associated with this condition. De Lee,⁴ however, refers to "poorly developed spines" as one of many possible causative factors.

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Cragin⁵ assigns considerable importance to the ischial spines. In 1916 Cragin stated that in occiput posterior positions there is "poor flexion, the occiput and sinciput reaching the pelvic floor at the same time and rotation is prevented by the spines of the ischia." Even more recently Harper,⁶ in speaking of deflexion as an etiological factor, stated that "the larger plane meets increased resistance in rotation, as might be expected. The situation is still further complicated by the fact that the broad diameter must rotate on a level approximating that of the ischial spines. Were the latter but little overprominent, slight success would attend efforts of uterine and pelvic-floor muscles to direct the occiput forward. Many cases of persistent posterior in multiparae are explained on this basis."

From a reference to the literature it is obvious, then, that the question, although over a century old, is still unanswered. In fact, during this entire long period the only contributions to the subject are a few scattered personal opinions and impressions. And yet, the subject is not only of great theoretical interest, but of much practical importance since a knowledge of etiology is a prerequisite to effective prophylaxis and to rational treatment.

PELVIMETER MEASUREMENTS

Very recently the situation has been changed by the introduction of a pelvimeter for the accurate measurement of the bispinous diameter.⁷ By means of this instrument it is now possible to secure quantitative data in large series of cases. By such measurements it can be demonstrated with what frequency the narrow bispinous diameter and the occiput posterior position are associated. The present study was undertaken with the object of ascertaining by statistical means whether or not any coincidence or relationship exists between these two conditions.

CLINICAL DATA

The bispinous diameter was measured in a series of 620 consecutive prenatal cases. The average measurement was found to be 10.5 centimeters. Pelves with a bispinous diameter of 9.5 centimeters or less were rather arbitrarily classed as narrow, and those measuring over 9.5 centimeters as normal or large. According to this classification 107 pelves fall into the first group and 513 into the second group.

Positions were regarded as posterior when the occiput was found behind the transverse of the pelvis at the time of delivery. The occiput posterior was regarded as persistent when no progress occurred after one and one-half hours or more of efficient second-stage pains. Only cases of occiput posterior in which the head was well engaged were included in the series, since the influence of the ischial spines cannot come into play unless the head is deeply engaged.

Ten cases of persistent occiput posterior position, satisfying the above requirements, were encountered in the consecutive series of 620 cases. In every one of these cases the bispinous diameter was 9.5 centimeters or less, averaging 9.3

centimeters. With the exception of a moderate narrowing of the bi-ischial diameter (average of 10.3 centimeters) the other measurements were essentially negative in these pelves. Nine of the patients were delivered by low or low-mid forceps, following manual or instrumental rotation of the head. A craniotomy was done in one case on a dead fetus with a prolapsed cord. The weight of the infants ranged between 3090 grams and 4454 grams with an average of 3658 grams. Eight of the patients were primiparae.

The few cases in which delivery occurred spontaneously with the occiput toward the sacrum are not included in the study because of incomplete records.

Through the kind coöperation of Dr. Alfred Spalding it was possible to follow up a number of cases of occiput posterior delivered on the obstetrical service of Stanford University Medical School. As in the first series, only deeply engaged and truly persistent posteriors were selected for study. The bispinous diameter was measured in seven such cases; in six of these the measurement was 9.5 centimeters or less, and in one case 10.5 centimeters; the average measurement for the group was 9.4 centimeters. Forceps were used in six of the cases after manual or instrumental rotation of the head, and in one case delivery occurred spontaneously following manual rotation. The weight of the infants was 3440 grams to 3830 with an average of 3547 grams. Four of the patients were primiparae.

COMMENT

By combining the Stanford with the San Joaquin General Hospital series a total of seventeen cases of persistent occiput posterior is obtained for study. Although the series is small it represents the pathological material of over a thousand labors. Furthermore the paucity of material is to a considerable extent compensated by the very accurate means employed for the measurement of the bispinous diameter, and by the definite and clear-cut criteria used in the selection of the cases of persistent occiput posterior position. Any possible error was thus reduced to a minimum.

The significant finding that emerges from the present study is the circumstance that the bispinous diameter was narrow in sixteen of seventeen cases of persistent occiput posterior position. This fact is even more striking when it is recalled that the narrow bispinous diameter occurs in only one out of six pelves. The logical inference that may be drawn from this constant association of the two conditions, is that the narrow bispinous diameter forms a serious obstacle to rotation and thus contributes to the persistence of the posterior position.

Among the other pelvic abnormalities the funnel pelvis has been considered as a possible factor in the etiology of the persistent posterior position.^{8,9} It is true that there is a much greater incidence of the persistent posterior in funnel pelves. However, it seems, that the real cause of the malposition in these pelves is the associated

narrow bispinous diameter rather than the narrow bi-ischial diameter, since the spines being situated superiorly and posteriorly would present an obstacle to the rotation of the occiput before the pubic rami or the ischial tuberosities could exert their influence.

The above observations may have a very practical bearing on treatment. In occiput posteriors associated with a narrow bispinous diameter, intervention would be indicated earlier than under similar circumstances in a normal pelvis. In the former it would be questionable whether the usual policy of conservatism should be followed. If there is good evidence that the occiput is locked between the spines, that is, if the head is of average size or larger, is deflected and deeply engaged within a narrow bispinous diameter, it would be unwise to wait for signs of maternal exhaustion or fetal distress before intervening. Under such circumstances anterior rotation is unlikely to occur, and undue delay would merely result in impaction rendering manual or instrumental rotation difficult and version hazardous, not to mention the unnecessary suffering and the other well-known difficulties and dangers incident to a protracted second stage. These considerations are presented, not to encourage indiscriminate interference or a radical departure from well-established principles, but to point to a finer differentiation and selection of cases which may possibly lead to more rational management of the troublesome occiput posterior positions.

SUMMARY

The bispinous diameter was accurately measured in a series of cases. The data obtained show that the persistent occiput posterior position occurs almost invariably in pelvis with a narrow bispinous diameter. The inference drawn from this observation is that the narrow bispinous diameter forms a serious obstacle to the cardinal movement of rotation. The practical bearing of this conclusion is the indication for earlier operative intervention in deeply engaged occiput posteriors occurring in pelvis with a narrow bispinous diameter.

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CARBON DIOXID ABSORPTION FROM ANESTHETIC MIXTURES*

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THERE is no evidence that nitrous oxid gas enters into any chemical combination with body tissues when it is inhaled. This is probably true of other anesthetic gases, ethylene, for instance. Nevertheless, gases are habitually wasted in large quantities in order that the carbon dioxid exhaled by anesthetized patients may be eliminated into the atmosphere. In 1916 and following, numerous reports were made from the laboratory of Jackson describing various means of absorbing exhaled carbon dioxid from anesthetic gases and vapors. The first experiment made by Jackson and Mann was described as follows. Two dogs were placed in a gas-tight cabinet filled with twelve gallons of nitrous oxid. The contents of the cabinet were constantly pumped out through a solution of alkali which absorbed the carbon dioxid, then back into the cabinet. Oxygen was constantly liberated into the cabinet in small quantities. By this means the two dogs were kept anesthetized for twenty-four hours with the original twelve gallons of nitrous oxid plus sufficient oxygen to maintain metabolic activity.

Although there is no evidence that ether is chemically affected while producing anesthesia, it does tend to dissolve in the fats of the body to a greater and greater extent as the period of anesthesia is prolonged. There is, therefore, an apparent disappearance of ether from the circulation as it is dissolved out of the blood by lipid tissue. As the ether comes back into the circulation during recovery, it leaves the blood through the alveoli and gradually, over a period of hours or days, is completely eliminated. Just as with the anesthetic gases, ether has been wasted to a large extent in that it had to be expired from an anesthetized patient in order to eliminate the carbon dioxid produced by that patient. The volatilization of ether has long been understood to take place more readily in the presence of a moderate amount of heat. The need for constant elimination of carbon dioxid has, however, made it impossible to satisfactorily warm inspired ether vapor by means of the patient's body heat. Many attempts have been made to warm ether vapor before it is delivered to the patient. Heating devices, however, have always been more or less unsatisfactory and dangerous because of the fire hazard. Heating devices may result in oxidation of ether, producing various impurities which are toxic. A closed system without exhalation valve permits the vaporization of ether in a warm medium due to the accumulation of body heat, but with the accumulation of body heat occurs an extensive unphysiologic accumulation of carbon dioxid, resulting in the necessity for its removal.

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